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Editorial: How should Christians assess Intelligent Design?



The year 2005 has brought Intelligent Design (ID) into the centre court of public debate. Leading science journals like *Nature* and *Science* have devoted much space to ID, and one issue of *Nature* featured ID on the cover. The subject has been widely discussed in the US and the UK and the dominant view is that ID is bad news for science. However, even the opinion-formers had to sit up and think in August when they heard President Bush saying that "both sides ought to be properly taught." Last year, British Christians were able to listen to Professor Philip Johnson, one of the architects of the ID movement, as he toured our country. Two of his many books already have British (Christian) publishers. A book by another leader, William Dembski, has recently been published in the UK by IVP. What are we to make of the ID initiative?

This editorial is written with the conviction that ID is to be welcomed. It is far from being an intrusion into our Christian heritage. ID leaders are expressing clearly and incisively an understanding of the created order that is essentially biblical. Our forefathers held similar views, but their thoughts lacked maturity and were expressed in a less rigorous way. In essence, ID is the view that intelligent design is manifested in the created order. Design is not an aesthetic response to creation or a subjective feeling. Design is really there. Concluding that life is designed is not a matter of faith, but a matter of physical evidence. Design is an objective characteristic of the natural world and so the recognition of design rightly belongs to science.

For years, Christians have been defensive about design. We have allowed values drawn from the Enlightenment to govern our thinking. Those values involve "secularisation": the view that science is done without any metaphysical overtones. The leaders of science have often been openly secular, claiming that science has removed the need for belief in God. What they have actually done, however, is to redefine science so that God is irrelevant. These are people who insist that all reality must conform to the

laws of physics and chemistry, and that every explanation must involve either "law" or "chance" or both.

A recent example of secular thinking comes from James Watson, the co-discoverer of DNA and a Nobel prize-winner. "One of the greatest gifts science has brought to the world is continuing elimination of the supernatural, and it was a lesson that my father passed on to me, that knowledge liberates mankind from superstition." (Why Darwin's still a scientific hotshot, *Los Angeles Times*, September 18, 2005)

ID is a bold attempt to reclaim science from the secularists. "Science" has no business insisting that nature must conform to certain philosophical prescriptions. When we look at causation, there are three types we can distinguish: "law", "chance" and "intelligent agency". Science cannot exclude intelligent agency as a matter of principle! Its agenda is to examine the evidence without prejudice and to build a clearer understanding of the natural world.

ID theorists point out that science has never thrived when it prescribes the answers to our questions. The Christian pioneers of science abandoned Aristotelianism, which did attempt to reason its way to answers. To say that ID is bad news for science is absurd! The reality is that ID is liberating science from the straightjacket of secularism.

The very least we can say from a Christian perspective is that God has the right to create as he pleases, without being constrained by anything we might think about what he can do and what he cannot do. Furthermore, Christians have always recognised that God is the Author of physics and chemistry. The reason we refer to the "laws of nature" is that the early scientists drew an analogy between God's laws in the moral realm and God's laws in the natural realm.

Christian design theorists do not argue that explanations based on "law" or "chance" mean somehow that God is not in control or that these events have not been purposed by God. On the contrary, *everything* in creation comes under his sovereign control. "Law" and "chance" are aspects of providence: God's government of creation. His power is seen everywhere. Through Christ, the world is upheld and sustained. We marvel at the power of God in miracles, but his power is no less in the ordering of "normal" processes we see every day. In affirming intelligent agency, Christians affirm that God is not bound by the "laws" of providence, but is free to act in whatever way he chooses. It certainly makes a difference to our praying when we believe this!

Whilst "law" and "chance" can be secularised and made palatable to unbelieving man, "intelligent agency" cannot. Secularists have reinvented God's providence in terms of impersonal, undirected mechanical processes, and this is where they draw a demarcation line as to what counts as reality. Intelligent Agency appears to them as an intrusion, threatening

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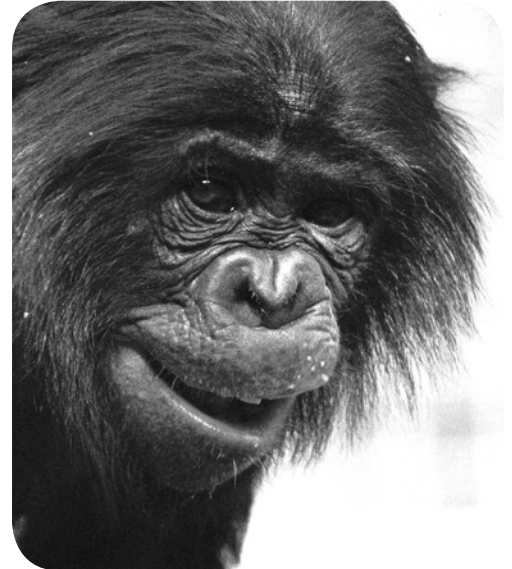
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■ Intelligent Design:
Is it science?



David Tyler

It is widely recognised that intelligent design can be discerned by analysing computer code, an artist’s painting, or the construction of a building. In these cases, the design inference belongs within science. However, can the same methodologies be applied to nature? As described by its advocates, Intelligent Design (ID) is the affirmation that the hallmarks of intelligent design can be seen in the natural world. However, it often described by its opponents as “religion dressed up as science” and treated as a reversion to the “discredited” natural theology of the 18th and 19th Centuries. This article is a contribution to the debate about the status of ID, arguing that the roots of both the ID thesis and the controversies surrounding it go back many centuries.

In a recent essay in *The Guardian* (1 September 2005), Richard Dawkins and Jerry Coyne make strong claims about the concept of ID.

“Intelligent design is not an argument of the same character as these controversies [*i.e.* controversies within science]. It is not a scientific argument at all, but a religious one. It might be worth discussing in a class on the history of ideas, in a philosophy class on popular logical fallacies, or in a comparative religion class on origin myths from around the world. But it no more belongs in a biology class than alchemy belongs in a chemistry class, phlogiston in a physics class or the stork theory in a sex education class.”

In their view, ID offers no evidence but simply makes sweeping assertions of a religious nature. Before the “absence of evidence” claim can even be addressed, it is necessary to consider whether the rejection of ID is a matter of principle, or whether it is because of a failure to engage with scientific evidences.

Thomas Aquinas (1225-1274) is widely regarded as the theologian *par excellence* in the Medieval Catholic Church. He saw Aristotle as the greatest of human philosophers: someone achieving the highest level of human thought without the aid of revelation. Aquinas proposed a way of incorporating the essence of Aristotle into the Christian intellectual tradition. He did it by arguing that the world of nature could be known separately from the world of the spirit. The sacred could be distinguished from the secular. Using more contemporary terminology, Aquinas compartmentalised knowledge. This analysis of Aquinas’ approach is drawn from Schaeffer (1968) and was previously discussed by Tyler (1997).

Sacred	Church: grace
Secular	Aristotle: nature

Many generations later, the idea that God has revealed himself in the Book of Nature and the Book of Scripture was widely held. Galileo, for example, referred to the “two books” to explain the relationship between church teaching and science (Tyler, 1997). He argued that in the natural world, there is objectivity and clarity which may not be found by reading the Scripture – which uses words adapted to common understanding. In areas of conflict about natural phenomena, he held that the revelation obtained from the natural world should be preferred.



Francis Bacon provided inspiration for the founders of the Royal Society in England, but was the route for secular thought to enter Protestantism. © David Tyler

The influential Francis Bacon incorporated the “two books” approach into his own philosophical writings (Tyler, 2003). These are widely regarded as having supported and stimulated the rise of science as a discipline. Certainly, Bacon provided inspiration for the founders of the Royal Society in England and gave a boost to scientific work in many European countries. Bacon urged that men “do not unwisely mingle or confound these learnings together”.

A contemporary testimony to the impact of Bacon’s philosophy comes from Marston and Forster (1989):

“One could hardly exaggerate the standing and influence of Bacon, both on Western science and on the thinking of Bible-believing Christians in their attitude to it ... Other early members of the Royal Society tended to see themselves as Baconians, and his approach was standard to scientist Christians in the seventeenth and eighteenth centuries. In fact, mainstream scientist Christians in Western Europe for well into the nineteenth century (if not later) saw themselves as following the traditions of Bacon, Descartes or both” (p.265-266).

Whereas Marston and Forster see Baconianism as representing a worthy Christian tradition, Tyler (2003) concluded that Bacon was the route for secular thought to enter Protestantism.

In recent years, Stephen Jay Gould (2001) has continued this approach to compartmentalising knowledge and has called it by the name of NOMA, or “non-overlapping magisteria”. By “magisterium,” he meant “a domain where one form of teaching holds the appropriate tools for meaningful discourse and resolution.” Science and religion, he maintained, are properly understood as being different

“Theistic science does not imply that we abandon using the causal mechanisms of law and chance. Theistic science has full access to all the tools that are currently used by scientists, but it rejects the dogma that all causation must be natural (i.e. exclusively law or chance.”



magisteria. “Science tries to document the factual character of the natural world and to develop theories that co-ordinate and explain these facts. Religion, on the other hand, operates in the equally important, but utterly different, realm of human purposes, meanings and values – subjects that the factual domain of science might illuminate, but can never resolve.”

Professor Donald MacKay has been a very influential figure in Christian circles in my own generation. He drew attention to several features that are common to both the present practice of science and to practices at the inception of the Royal Society in the mid-seventeenth century. First among these was said to be respect for the natural world, because nature was seen to be rational. “The book of nature (as they put it) ought to be read. Like the Bible itself, it could not fail to reward the man who approached it in the right spirit.” (Dimery, 1998)

The implications are explained in a way that involves two non-overlapping levels of knowledge: “MacKay was keen that God should not be seen as an explanation for events on the descriptive level of scientific explanation, but maintained that theological matters addressed different questions. Cosmology is relatively well-equipped to answer questions such as “**How** did the universe as we know it come about?” but Christianity addresses questions such as “**Why** did the universe as we know it come about?” Science is not suited to matters of teleology; neither does Genesis attempt to give a scientific textbook description of the first minutes of the universe.” (Dimery, 1998)

In this way, MacKay linked design with “why?” questions and promoted complementarity as the primary way of understanding the science and faith issues. The key arguments are to be found in MacKay (1965).

There is an obvious continuity in the thinking of the various scholars noted above. They all lead to similar conclusions about some very important questions.

- (a) Science is an autonomous source of knowledge
- (b) Science and faith questions are distinct and they should not be mingled

These conclusions have been an important legacy for successive generations. They have led to the secularisation of science and the secularisation of Christian thinking about science. According to Holton (1993, p.164), secularisation is one of the four “great novelties” that became part of the modern world picture.

Also, this approach has led to the development of a theological tradition that by-passed the Scriptures. The Two Book approach supported the development of Natural Theology in the 17th and 18th Centuries. Scientists who were Christians were willing to use their autonomous knowledge to show that God’s handiwork is manifested in the natural world. They found the marks of God’s wisdom everywhere they looked. However, Francis Schaeffer saw this trend as a legacy from Aquinas: a consequence of his dividing knowledge into two autonomous realms. Writing in *Escape from reason* (1986), he says:

“One result ... was the development of natural theology. In this view, natural theology is a theology that could be pursued independently from the Scriptures.” (page 11)

When Darwin explained “design” as “designoid”, there was no place left for the handiwork of God manifested in living things. The Creator was consigned to the role favoured by Deists: the First Cause. This is where Darwin was prepared to put Him in the last sentence of *“On the Origin of Species”*: “There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; ...” However, whilst Darwinism was consistent with both Deism and atheism, Deism was on the decline in the scientific community. In the 20th Century, it was effectively eclipsed by atheism and the consequence has been the complete secularisation of science.

So where does this leave us? How can we engage with these deep-seated views?

- We cannot appeal simply to the “Christian” roots of science. These roots were mixed. There were strong Christian influences, but also other philosophical emphases that were inconsistent with biblical Christianity. These roots led to the acceptance of the “Two Books” approach by many Christians, from the rise of science to the present day. What we really want to do is to change this mindset.
- What we can do is remind people that many pre-Darwinian scientists were quite prepared to recognise “design” in their scientific work. These were theists who recognised the wisdom of God in creation (Tyler, 2004). For these scholars, “design” was part of science.

- Theistic science does not imply that we abandon using the other causal mechanisms of law and chance. Theistic science has full access to all the tools that are currently used by scientists, but it rejects the dogma that *all* causation must be natural (*i.e.* exclusively law or chance).

In reviving the principle that design can be understood within science, we are not reviving natural theology (although there is obviously a danger of doing this). Rather, this strategy builds on a Christian foundation for science, where causation may be mechanism (natural law), chance (randomness) or intelligent (God's agency). The Explanatory Filter tool has been developed by Dembski (1998, 2004) to show how design inferences can be integrated seamlessly within a scientific approach without compromising law and chance. Within this approach, the issue is not the "absence of evidence" but the significance of the evidence we have in profusion.

Theistic science was practiced by the pioneers of science in the 17th Century, but it lacked a coherent theoretical foundation. Baconianism did not provide it and this led to the tradition known as "Natural Theology". The consequence was "god-of-the-gaps" thinking, inherently modified Deism, where the Creator provided the causal inputs that law and chance could not deliver. Unfortunately, design inferences were based often on ignorance rather than evidence, to the discredit of the whole tradition. To this day, design thinking is accused of being a reversion to "god-of-the-gaps" anti-science. Contrary to this, Theistic science perceives the hand of God in *all* aspects of creation: law, chance and intelligent agency. The design inference is made after considering all the relevant scientific evidence. It is not an intrusion, an add-on nor an opt-out, but an inference that is integrated *within* science. As Larmer (2002) has shown, there is nothing inherently illegitimate in invoking a supernatural cause to explain specific events.

The discussion above implies that science has operated with different philosophical roots. This is an important aspect of contemporary debate. Ultimately, the ID debate is not about details, but about foundations. Kuhn (1970) pointed out that the redefinition of science is commonly a characteristic of scientific revolutions:

"... the reception of a new paradigm often necessitates a redefinition of the corresponding science. Some old problems may be relegated to another science or declared entirely "unscientific". Others that were previously non-existent or trivial may, with a new paradigm, become the very archetypes of significant scientific achievement. As the problems change, so, often, does the standard that distinguishes a real scientific solution from a mere metaphysical speculation, word, game, or mathematical play." (p.103)

It should not surprise us that some are advocating a secularist definition of science and describing ID as unscientific. These people have spent all their lives thinking that God has nothing to do with science and now their own intellectual foundations are threatened.

This philosophical analysis also explains why Theistic Evolutionists are so opposed to ID. They have imbibed the secularist definition of science, which requires them to pursue all their scientific work with the methodology of naturalism (law and chance are causal mechanisms sufficient to explain all observations). This definition means that intelligent design in nature cannot be perceived as a "scientific" concept, so the Theistic Evolutionist *has* to locate it within the separate sphere of aesthetics and faith, complementary to the sphere of science. Baconian compartmentalisation has led them to adopt essentially the same attitude to ID as is evident in the writings of Dawkins and Coyne (2005).

The Intelligent Design Movement (IDM) offers an opportunity to restore and redefine science. It can be supported by Christians from many different backgrounds, but all with the conviction that design is part of science. The implication is far-reaching: detecting design breaks the mechanistic causal chain (the hallmark of naturalism). If design is recognised as highly probable, developing alternatives to Darwinism then becomes the responsibility of all life-scientists! ■

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■ 'God of the Gaps': A Valid Objection?



Steven Lloyd

The danger of the 'god-of-the-gaps' fallacy is a defining dogma for theistic evolutionists¹. If you want to make sure an idea is rejected by a theistic evolutionist all you need to do is demonstrate that it would mark a return to 'god-of-the-gaps'². Nelson and Reynolds (1999) capture well the impact that this concept has.

'The God-of-the-gaps fallacy has become so terrifying a monster that, at the mere mention of its name, otherwise stalwart scientists and philosophers scurry for the safety and cover of such philosophical doctrines as methodological naturalism. "You won't catch us committing a God-of-the-gaps blunder!" they call from their coverts.'

It is pervasive as an objection to both young earth creationism and intelligent design in the writings of theistic evolutionists. Whether it is persuasive is another matter.

What is god-of-the-gaps?

In essence 'god-of-the-gaps' refers to the practice of using God as an explanation for what we do not presently understand (A non-scientific example of the god-of-the-gaps fallacy can be found in the tale *Robinson Crusoe* as cited by W. A. Dembski (1999a). So, for example, when there is no scientific explanation for some phenomenon or historical event Christians then say "God does it", or "God did it." When scientific advance later provides

an explanation God is no longer needed as an explanatory agent and is left with increasingly less to do. By being placed in the gaps of our current scientific knowledge God becomes redundant as science advances. Theistic evolutionists object to the whole approach of trying to find evidence of God's activity, usually for apologetic purposes, in this way. As Dennis Alexander puts it (Alexander 1998), "Christians have no hidden theological investments in ignorance." The argument is equally cogent for intelligent design theories as for Biblical creationists since both share a belief in the inadequacy of the conventional evolutionary explanations. For example in a review of Behe's *Darwin's Black Box* by Michael

Notes

1. Theistic evolution is a label that can cover a wide variety of positions. In this article I use it to refer to its strongest and most self-consistent form in which the conventional evolutionary account of earth history is seen as broadly correct with no need for divine 'intervention' at any point i.e. they would not dispute the adequacy of, for example, Richard Dawkin's account of the history of life on earth on scientific grounds, only the atheistic conclusions he draws from it. Weaker forms of theistic evolution that include some divine intervention at key points (e.g. creation of single celled life) combined with the conventional evolutionary development would be critiqued with the 'god-of-the-gaps' objection by those that hold to the stronger form of theistic evolution.

2. The phrase is often written with hyphens, presumably to identify it as a single concept. The lack of 'gaps' in the label contrasts with the gaps in that to which it refers!



Notes

3. I am limiting the discussion here to earth history but similar arguments are also made concerning the history of the universe and the extent to which the design of a deity is discernable in, for example, the 'fine tuning' of fundamental physical constants. In general theistic evolutionists seem to be more comfortable with seeing evidence for God's design there, perhaps because the arguments for design have often come from non-religious scientists. But even here I detect a fear of god-of-the-gaps that makes theistic evolutionists reluctant to press the design required by current cosmological models as evidence for God.

4. The position is similar to that adopted by well meaning Christians in the 19th century who tried to safeguard the faith in the face of the attacks of critical scholarship on the reliability of the Bible. They did this by marginalising the importance of the history contained in the Bible since, they argued, it was the theology rather than the history that is important. Such an approach does neutralise the attacks of the critics but at the cost of a major distortion of the Christian message whose theology is inextricably linked to history as is seen most clearly, but not exclusively, in the resurrection. "If Christ has not been raised, your faith is futile" (1 Corinthians 15v17)

Roberts his principal objection is that Behe has fallen into a god-of-the-gaps mistake (Roberts 1997):

"For all Behe's lucidity *Darwin's Black Box* is highly unsatisfactory as it is basically the God-of-the-gaps argument covered in amino acids. It is unconvincing and, more seriously, if or when disproved will make Christianity less credible"

Theistic evolutionists have a laudable motive: they are concerned at the propaganda victories that atheism has gained from Christians who have adopted a god-of-the-gaps argument and been proved wrong. Thus theistic evolutionists objection to god-of-the-gaps arguments is partly historical – when Christians have used this in the past they got their 'fingers burnt.'

But the theistic evolutionists' argument is not purely negative in seeking to avoid a particular apologetic trap. They argue on a positive theological basis that we should not expect any 'gaps' in the created world in the first place. Van Till (1996) uses the phrase the 'functional integrity' of creation. Creation is 'fully gifted'. It is sufficient on its own, by its own natural processes, to make everything we find today. There are no 'gaps' that divine intervention would be required to fill. This is portrayed as taking a strong view of God's providence – the concept of God *upholding* creation is often emphasised. Thus God is involved in creation at all times, not just when a 'miracle' is needed. Van Till emphasises that the greatness of God is magnified by this understanding. God's wisdom is all the greater since He has devised something as intricate as the evolutionary process to create mankind.

So how should we respond to this fear of 'god-of-the-gaps'?

Lessons from history

Is the problem as serious as is alleged? Moreland and Reynolds (1999) state that:

"On closer examination, the gaps argument turns out not to be an actual argument. It is more a bit of apologetic advice. Few contemporary philosophers have risen to defend this worry as being legitimate. Despite claims of worried Christian scientists, the God-of-the-gaps strategy has limited historical applicability, at least in the contemporary setting. There are few, if any, cases of serious Christian thinkers actually falling into gap thinking."

One example that is often cited is that of Newton who postulated God's intervention to explain the apparent instability in the orbits of some of the planets that were not accounted for by his own theory. One of the interesting things about this example is that his contemporaries actually questioned Newton's idea, partly on theological grounds! (Meyer 2000a) The god-of-the-gaps warning has more force if it is understood more loosely as referring to the

way a general cultural mysticism was swept away by the explanations of science. So, for example, the popular ideas that comets were special signs from God lost its force when their path was explained by Newton's laws of gravitation (Brooke 1991a). Similarly, lightning conductors were initially opposed on the grounds that they interfered with the sovereignty of God (Brooke 1991b), although prominent Christians such as Wesley did not share this understanding (Brooke 1991c). But modern debates, for example on origins, share little similarity to these historical examples. The mystical thinking about the world challenged the very nature of scientific investigation and is not shared by modern creationists or intelligent design theorists.

Moreland (1994a) argues that the god-of-the-gaps fallacy has occurred when God's action has been appealed to as an explanation in *empirical* science (dealing with repeatable, regularly occurring events or patterns in nature). The example of the planetary orbits mentioned above would be a good example. However in historical science, which seeks to understand the origin of a past, often unique event, God's action can be a legitimate part of a scientific explanation. (See also Meyer 1994a and Meyer 2000b)

It is historical science, however, that is principally on theistic evolutionists' minds when they warn of god-of-the-gaps, and in particular the evolutionary account of earth history³. Here there does seem to be a clear example of where design in nature was used as evidence for God by apologists such as Paley, but then the evolutionary explanation proposed by Darwin refuted their argument. But we need to ask whether Darwin would have won the argument today. If they had known then all we know today of genetics and biochemistry would Darwin's theory have become established? Here is an example of where scientific advance has enlarged the 'gaps'. Far from diminishing the need for God to act beyond natural processes to create life modern science provides far more reason to insist that an outside designer was essential. (Dembski (2002) in *No free lunch* provides the most rigorous scientific argument available today for the need of an intelligent agent to create life.) The advance of science has secured the need for a non-naturalistic explanation. For example, Darwin recognised the intricacy of the human eye as a difficulty for his theory. Yet what we now know of the biochemistry involved in vision makes it even harder to postulate an evolutionary origin (see for example Baker, 2004).

Begging the question

The god-of-the-gaps objection *assumes* the gaps will be filled. But the issue at stake is whether the gaps are real or only apparent due to our current level of understanding. The assumption that there are no gaps demonstrates a prior commitment to methodological naturalism i.e. that it is possible to explain the existence of life by a purely naturalistic process that creates a seamless link between single-celled life and man. An atheist like Dawkins *has* to assume a process like this occurred for he has no alternative. The only debate for him is the details of the mechanism of that naturalistic process. Thus he is bound to accept even a poor naturalistic theory rather than one involving an intelligent agent even if the evidence supports the latter better. The mere existence of a naturalistic theory does not in itself make a theory invoking God's action false. The question is whether the naturalistic theory explains the data better than the theistic one.

The 'god-of-the-gaps' accusation is really a statement that, axiomatically, there are no gaps, rather than an *argument* against there being any gaps. The fact that some gaps may have been wrongly identified in the past does not mean there are no real gaps to be identified today.

Van Till's doctrine of the 'functional integrity' of creation is another example of question begging. It is hardly a self-evident doctrine and it lacks justification from scripture. (With respect to its application to evolution, all the Biblical arguments against a Darwinian model of origins, such as the need for suffering before the fall, are also relevant.) Where are we told that this is the principle by which God made the world? We cannot know except by looking at the world (See the discussion of Van Till's argument in Dembski (2002)) and the evidence overwhelmingly points to the inability of natural processes to account for the intricate designed structures we find. Miracles in the Bible (for all their limitations in inducing faith) are portrayed as signs of divine *intervention* (see discussion in Dembski 1999b) in a way that counts against the sort of doctrine Van Till proposes.

God's involvement in creation

Theistic evolutionists make much of their doctrine of God's sovereignty – that He is involved in all events 'upholding' creation (e.g. Col. 1v17), not just the 'miraculous'. But they have no monopoly on doctrine of God's sovereignty. I fail to see the relevance of this argument against creationists in particular, because I have *never* seen a creationist ever deny or question that God is involved in all that happens in the world. (The issue for Dembski is not whether God interacts with the world the *immanence of God*, but whether he does so in an empirically detectable way.) Our interest focuses on the miraculous because that is the point at issue but it in no sense denies the divine upholding of the regular. The problem for theistic evolutionists is that their concept of divine action in the world is entirely undetectable i.e. the world looks exactly the same as if there was no God since they do not question the scientific validity of the Darwinian model of origins. Not surprisingly atheists such as Dawkins are not impressed (Dawkins, 1995).

"If, on the other hand, there are no traces of God's involvement in the universe; if God did indeed set things up so that life would evolve, but covered His tracks so brilliantly that no clues remain; if He made the universe look *exactly as it would be expected to look* if He did not exist, then what we have is not an argument from design at all. There can be no argument from design if the universe is expertly designed to look undesigned. All we are left with, in this case, is the feeble, though strictly valid, argument that just because we don't find any evidence for a God, this doesn't prove that there isn't one. Of course we can't prove there isn't one but, as has been said sufficiently often before, exactly that same can be said of fairies and Father Christmas."

Conceding to naturalism

Theistic evolutionists avoid god-of-the-gaps by selling out to naturalism (almost) completely. Ironically their position is equivalent to someone who was a creationist who decides that science has filled all the gaps he had originally identified and admitted defeat. They have created an undetectable God and as such have a belief that is (conveniently) unchallengeable, but for that very reason it does not impress an atheist like Dawkins. The position is safe, but irrelevant to someone outside.⁴

The area where evangelical theistic evolutionists do not concede to naturalism is with central supernatural events such as the resurrection. But one wonders why this itself could not be seen as a god-of-the-gaps mistake. Maybe science will one day explain how a crucified man can rise from the dead by purely natural processes. Carson (1999) argues as follows:

"Would they [theistic evolutionists] want to propose that all the forces that brought Jesus back from the dead with a resurrection body can be explained on purely 'natural' terms? Or would they say in this case God dramatically intervened, setting aside the structures of normal physical forces to introduce a stunning miracle? And if God did so in this case, why should it be so difficult to imagine that he did so in connection with the creation – *especially* when the evidence for design, evidence *from the physical order*, is multiplying."

Reynolds (2001) also questions the consistency of some theistic evolutionists.

"Many of the Old Testament portions of salvation history do not fit contemporary natural science. Not surprisingly, these parts are often reinterpreted as non-historical. The happy result for the theistic naturalist is that exactly those stories most open to modern verification are declared purely theological and off limits. And stories, like the story of the resurrection, that are no longer likely to be challenged on scientific grounds are allowed historical content. Put another way, God uses "primary causation" when no scientists are looking."

To quote Warfield, Christians are 'unembarrassed supernaturalists' and one wonders why that could not also apply to creation. Similarly, I question the motivation behind Humphreys recent book on the Exodus (Humphreys, 2003), whatever the validity of the particular explanations he proposes for the Exodus miracles. Why should we feel compelled to provide a naturalistic account of an apparent miracle as somehow superior to a supernatural one? As Meyer (1994b) notes, why shouldn't a theistic explanation be seen as an advance of science – unless you are committed to naturalism.

Finally, I would note the cutting assessment Dembski makes of the cost of the position adopted by theistic evolutionists as actually undercutting any apologetic impact (Dembski, 1999c)

"If theistic evolution finds no solace from intelligent design, neither does it find solace from the Darwinian establishment. For the Darwinian establishment the "theism" in theistic evolution is superfluous. For the hard-core naturalist, theistic evolution at best includes God as an unnecessary rider on an otherwise purely naturalistic account of life. Thus by Occam's razor, since God is an unnecessary rider in our understanding of the physical world, theistic evolution ought to dispense with all talk of God outright and get rid of the useless adjective *theistic*. This, at any rate, is the received view within the Darwinian establishment.

"It's for failing to take Occam's razor seriously that the Darwinian establishment despises theistic evolution. Not to put too fine a point on it, the Darwinian establishment views theistic evolution as a weak-kneed sycophant that desperately wants the respectability of being a full-blooded Darwinist but refuses to follow the logic of Darwinism through to the end. It takes courage to give up the comforting belief that life on earth has a purpose. It takes courage to live without the consolation of an afterlife. Theistic evolutionists lack the stomach to face the ultimate meaninglessness of life, and it is this failure of courage that makes them contemptible in the eyes of full-blooded Darwinists. (Richard Dawkins is a case in point.)"

Not an argument from ignorance

It is a misunderstanding to think that the argument for intelligent design rests on ignorance (Meyer 2000c; Moreland 1994b). Rather is the logical deduction from known scientific laws. For example Dembski's explanatory filter (Dembski, 1998) detects design in a rigorous mathematical way. Evolutionists adopt similar reasoning themselves. The search for extra-terrestrial life involves the search for coded messages in radio waves which would be counted as positive evidence for alien intelligence. No one suggests such messages could be explained by an as yet undiscovered naturalistic process and that an 'alien-of-the-gaps' has been invented by the SETI scientists. Similarly, cave paintings are not explained by natural forces but as the creations of intelligent people. Such an explanation is not seen as an appeal to ignorance: the 'gap' is real and a scientific deduction from the evidence.

In this context the search for a naturalistic mechanism for the origin of life is as ridiculous in the light of what we know of the laws of science as funding a research program to find heat spontaneously flowing from a cold body to a hot one. Our current knowledge of thermodynamics says that is impossible, but maybe that is just present ignorance? Maybe alchemy has been too hastily dismissed as impossible due our limited current knowledge and should also receive funding? (Demski, 1999d)

Some lessons for intelligent design and creationism

There are some things for creationists to learn from the god-of-the-gaps argument. Notwithstanding the comments above, intelligent design objections to evolution are vulnerable to the god-of-the-gaps objection to the extent that they are negative theories saying in effect, "I bet you can't explain X". Biblical creationists have an advantage in that we are not first and foremost critiquing Darwinian evolution but presenting a positive model of earth history that we believe can explain the data better. Creationists are saying, "We can explain this data better," rather than, "You can't explain this". There are risks in building a positive model. Creationist theories are open to disproof by scientific investigation, but that is what ultimately will give them impact with a relevance to atheistic scientists that theistic evolutionists can never achieve.

It is important that we see creationist theories as part of an overall Biblical model of earth history. Disproof of one part of a model does not necessarily invalidate the whole, just as in the evolutionary model, hence God need not

be 'squeezed out' even where certain creationist theories are rightly abandoned. God will ultimately be sidelined if He is merely an 'add-on' to an essentially naturalistic worldview. The lesson of god-of-the-gaps is not to build an apologetic on an assumed naturalistic foundation. For theistic evolutionists to persistently cry 'god-of-the-gaps' is clever rhetoric, but like many 'sound bites' it is a charge that lacks substance. ■

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■ Arguments for Design:
Language and Communication – Part One



Nancy Darrall

To be deprived of language strikes at the very heart of our existence. Witness the devastating effects of profound deafness or a stroke. Without language it is difficult to express feelings, worries, plans, needs, hopes and memories; our personality is dependent on communication to become known and to develop.

There are two reasons why this topic is important for us. Firstly, communication is an ongoing activity within the Godhead (e.g. Genesis 1v26, Romans 8v26; Hebrew 7v25). It is not possible to conceive of the personal nature of God without it. Made 'in the image of God', we can also communicate not only with each other but also with God. In contrast animals are made "according to their kinds" and there is no reference to them communicating to each other and with God in the same way that God and mankind communicate. We need to examine the similarities and differences between animal and human communication because the Bible would lead us to expect a clear discontinuity between them whereas evolution would predict a continuity. Secondly, communication requires linguistic and cognitive skills as well as specific anatomy. We need to understand something of this complexity in any discussion of origins. This first article will focus on animal and human communication and fossil evidence for language abilities in the past. The second will consider anatomical and linguistic complexities from both developmental and communicative perspectives.

All animals have the ability to send and receive signals of some form. Communication can be defined as "the transmission of a signal from one animal to another such that the sender benefits on average from the response of the recipient" (Pearce 1978). Animals use a variety of means to communicate including sound, light, mechanical, chemical and electrical signals.

Visual communication

The dance of the honeybee is a fascinating example of communication. The worker bees forage for nectar, return to the hive and perform a dance on the honeycomb to tell the other workers about the nectar sources that they have found (Von Frisch, 1967a and b; references in Hauser, 1997 and Riley, 2005). The round dance, performed where the source is within 90 metres of the hive gives no indication of direction, but the waggle dance, performed when the source is a greater distance away, gives information on distance and direction from the hive relative to the position of the sun and is performed in a figure of eight. The amount of nectar is shown by the intensity of the waggles of the abdomen. This is a precise and elaborate signalling system that allows other workers to decide whether or not it is worth repeating the journey to collect more food. However, the signals do not allow communication of an unusual event, for example, hitching a lift on a car down the motorway to the next junction.

Communication by sound

The warning sign of a rattle snake is an inherent characteristic behaviour when the animal is threatened. The animal does not choose whether to respond or how to respond, a threat automatically produces this response. Similarly, the call of birds, whether a mating call, a territorial claim or a warning to a predator are predictable responses to a situation. There may be subtle variations in the combination of notes, but the message is one and the same,



Honey Bee. © emsage www.dreamstime.com



Vervet housed at Wernboo Zoo. © Michael Brown www.iStock.com

basically "come here" or "go away"! They are a close system of calls, rigidly and genetically fixed. We can identify the name of the bird by the song, despite the variations and complexity of those calls.

Similarly, gibbon songs can be divided up into 13 basic note types which convey information about the owners presence, location, sex, rank and marital condition (Mitani and Marler, 1989). Here we see calls built up of a number of discrete elements and containing representational meaning that is shared between members of that group. However, the gibbons are only conveying a small number of messages.

Cheney and Seyfarth (1990) studied the natural behaviour of Vervet monkeys in Amboseli National Park and described a number of clearly distinct calls. For predatory birds, mostly eagles, there is loud single syllable call given, difficult to locate, but loud

Human Communication	Animal Communication
Languages diverse and mutually unintelligible	Calls similar wherever the animal is found, rigidly and genetically determined
We are able to express virtually anything we like by combining the words we know (this known as discrete infinity)	A small number of messages conveyed
Can communicate about the past, abstract thoughts, prediction, planning, reflection, self-awareness, metaphor and questioning	In general only communicates about the here and now
Universal Grammar underlying all languages	Diverse systems of communication e.g. light, sounds, dance, threatening behaviours
Symbolic – arbitrary codes represent meaning but are independent of it	Signs – representational meaning, little variation
Intentional and rational imitation	Random or irrational imitation
Voluntary control even in children. Communication can be purely for the sake of it	Communicates in response to a stimulus
Humans can decide what to communicate	Communication instinctive

Table 1 Comparison of human and animal communication.

enough to alert Vervets in the area. For snakes, the call is soft, but multisyllabic enabling vervets to locate the direction and so search more successfully for the predator. For leopards, baboons, humans and other mammals, the call is loud and multi-syllabic. Other monkeys in the pack behave adaptively to the calls, looking up and hiding under bushes for eagles, down on the ground for snakes and looking around before running up a tree for leopards and other similar predators. There is an ability to understand and use a variety of messages, but there is a predictable response to a limited number of calls, all related to specific functions e.g. predators or food. Juveniles learn the calls, making mistakes especially in the first year, but all Vervets use more or less the same calls. There is no creative use of the calls, for example to plan for a future attack but no intentionality e.g. to trick or please another member of the group. Amongst other groups of animals, however, for example, wild and captive great apes there are numerous examples of intentionality to deceive (Hauser, 2001).

Many animals have been trained to understand and follow instructions and also give instructions to their carers by signs or pointing to tokens or symbols. Does this prove that these animals have the potential to develop communication? Can language evolve from these rudimentary skills? We must keep in mind the distinctive features of human language for comparison with the results of these observations.



Bottlenosed Dolphin. © Ozaris aka Igor Beres www.dreamstime.com

Communication experiments with animals

Pigeons have learnt to peck particular keys out of a large selection and in a certain order to request water and food. Rats have been taught to run through mazes using a fixed set of rewards and punishments. One particular rat, Barnabas, who lived in a laboratory in Columbia University, USA, was taught to climb scaffold, row boats and solve a variety of other problems for a pellet of food. (Eccles and Robinson, 1984) However, no rat can warn another rat what to expect.

An intensive programme of training with tame bottle-nosed dolphins (Herman, Richards and Wolz, 1984) taught them to understand and carry out instructions in sentences containing two and three information-carrying words. Examples of the vocabulary used were the words surface, bottom, pipe, frisbee, bucket, surfboard, gate, window, spit, right and left, fetch, go over, under, through and toss. One was taught a system of visual gestures and for the other a variety of whistles were used. They were then tested on novel sentences of up to five key words and were able to interpret them correctly in their subsequent actions. They could interpret them in linear order where word order made a difference to the meaning. Also, they rightly reassigned meaning when another instruction was added e.g. "no" or "erase". These are amazing feats and show that animals have the ability to be trained to a high level to carry out instructions for rewards, but it is a far cry from the creative language that appears so rapidly in young children who are not trained or given extrinsic rewards for understanding and using language.

Although the work on dolphins was restricted to developing understanding a form of communication with no opportunity for the use of it, other research



Bonobo Chim 'Tamia'. © Dave Liggett www.daveliggett.com

looked at both aspects. Experiments teaching primates in captivity to speak, sign or use plastic token to request items or point to symbols have fascinated the public and generated much debate in scientific circles. The names Washoe, Lana, Sarah, Austin and Sherman will be familiar to those who have followed this work (e.g. Savage-Rumbaugh, 1990). In the 1970s, there were about a dozen chimps in various laboratories in the USA. Valid criticisms of the earlier studies were made and strenuous efforts made to avoid these problems by later researchers. Terrace (1979) worked with a chimp, Nim Chimsky (after the linguist Noam Chomsky) in the 1970s, spending \$250,000 and using 60 teachers with the result that the chimp had learnt 125 signs. Over an 18 month period, 19,203 utterances had been signed, 5,235 different ones, but the experimenters were unable to deduce any rule based language structures. Analysis showed that 12% of signs were used spontaneously, the remainder were immediate or delayed imitation. Initially enthusiastic about the results, by 1979, Terrace and his colleagues had blown the whistle on the studies declaring them to be only "subtle and complex imitation". There was no evidence of turn-taking (the skill that orchestrates a smooth alternation between participants of a conversation so that the topic is mutually developed without both speaking at the same time) which is so fundamental to human language (Terrace, 1981). At times, the signing was not directed towards the teacher, but off to the side or done when under a table away from the teacher. Examples of Nim's utterances are "You me banana me banana you." "Tickle me Nim play." "Give orange me give eat orange me eat orange give me eat orange give me you." They bear scant resemblance to the sentences of children aged 2-3 years of age. The mean length of utterance remained at around 1.5 words, by comparison, children show a sharp increase in length with age. Nim increased the length of what he said by repetition. Jane Goodall, (unpublished, quoted by Pinker, 1994 p338) who had extensively studied the behaviour of primates in the wild, visited the project and declared that there was no more gesture



Jonathan Lynn at about 2 years of age (with kind permission).

than in the natural setting. Nim was using the same repertoire of natural gestures rather than taking on the arbitrary signs of American Sign Language that he was being trained to use. Interestingly, people whose first language was American Sign Language consistently logged less utterances than other researchers, suggesting that a proportion of the gestures were not information carrying, but just movement for its own sake. Virtually all the signs used were to request something, usually food or play, and most object signs referred to any aspect of a particular situation. For example, "toothbrush" was used to refer to toothbrush, toothpaste, 'brushing teeth', 'I want my toothbrush' and 'time for bed'. It is instructive to reflect on the difference between this and the example of J. G. Penner (2000) in his book on the subject of Language and Speech. A niece of his, when aged 2, was admiring a light in the distance and said "pink" demonstrating a desire to communicate with other humans just for the sake of it, not for a reward or to make a request.

In the 1990s, just the research group at Yerkes Regional Primate Research Center in Atlanta Georgia was continuing the work on language in primates. Sue Savage-Rumbaugh designed her experiments to avoid the errors of earlier programmes. A Bonobo ape, Kanzi, learnt a system of visual symbols and also manual signing during the day to day activities

of life in a 50 acre parkland. Kanzi was in the company of researchers 7 days a week for at least 9 hours a day over a period of 3.5 years. By the end of this time, when Kanzi was 6 years old, researchers had recorded 12,691 utterances for analysis. The majority, 96%, of those utterances were requests which means that Kanzi did receive a reward 96% of the time, not in the usual sense of conditioning experiments, but by receipt of the requested item.

By the time he was 5 years of age, Kanzi achieved 104 out of 194 items in a vocabulary test. He also started responding to more complex and novel requests by the researchers, although in many cases he only needed to understand one key word in the sentence to comply with that request, for example, "Would you please carry the **straw**." Also, he understood requests containing two key words, such as "Get the **carrot** in the **microwave**." "Carry the **cooler** to **Penny**." "**Kanzi** chase **Kelly**." (there was a game in progress where Kanzi was already chasing). Note that, although combining the understanding of two key words is necessary, the other words need not be understood to carry out the command. Also, word order is not always essential to comprehension. For example, you cannot 'get the microwave that is in the carrot' and it is unlikely that carrying 'Penny to the cooler' is an option! One example where Kanzi demonstrated correct understanding of a sentence which was sensitive to word order was "put the lemonade in the water." However, the number of such occurrences was not given; to be convinced as the speech therapist that a child understands such a sentence correctly, I would need more evidence!

In return, he was able to link two or more signs together. Examples of utterances using sign and pointing to the boards included "Ball go grouproom" "Grab Kanzi" (at which point he put his leg out) and "Matata bite" (he was referring to his mother telling him off.) The predominance of the same word order (English) as that used by the carers is taken as evidence that Kanzi has the grammatical competence to express the difference of 'something done to' and 'something done by' (Greenfield and Savage-Rumbaugh, 1990). They refer to it as proto-grammar, equivalent to that of a two year old child. However, the reverse order was also used by Kanzi, unlike a two year old children developing language. In contrast, by this age, a child is generating an endless array of novel sentences and communicating readily with anyone and everyone. In contrast, there are no reports of Kanzi using his skills to try and communicate with another Bonobo ape, either his mother or his sibling Malika, who was also involved in the work. Neither is any comment made on pragmatic skills, such as appropriate looking, turn-taking and topic maintenance, so integral to two-way communication between people and well developed even in young children. Further criticism can be found in Joel Wallman's (1992) review of the topic; it makes sobering reading for the enthusiast!

It is perhaps a telling aspect of the work that most of those who have trained chimpanzees have refused all requests to share their raw data. (Pinker, 1994 p 337) It should be remembered that pigeons can be taught to press keys in a certain order to receive a reward, so, with no implied insult to Kanzi and his researchers for all that they accomplished, a 'bird brain' is adequate for this level of communication! In addition, rather than ask the question about whether the primate can learn the task, we need to consider whether it is the outcome of a similarity in neurology and cognition between ape and man or whether it was the result of training by competent language users teaching Kanzi learnt strings of words. Steven Pinker (1994), discussing this research in his book 'Language Instinct', concludes "deep down chimps just don't get it".

So, is there any evidence of a smooth evolutionary progression from animal

communication to human communication? Only humans, and only children at that, can master a first language without any specific instruction. Chimps need extensive training to gain a little. There is an enormous gap between chimps and humans in their capacity to learn and use vocabulary and in their ability to understand and use grammar. Even with the Herculean effort of trainers in various research projects with primates, the rate of learning words was vastly inferior to human infants suggesting that quite different mechanisms are involved (Hauser *et al*, 2002).

More significantly, though, only humans can combine discrete words into phrases and phrases into sentences to generate an infinite array of complex meanings (discrete infinity). Each utterance is discretely different from another, providing limitless power to express meaning, whether spoken or a natural sign language. Observations and studies of a range of animals show that some have a rich understanding of concepts, for example, family relationships and hierarchy in primates, but not the capacity to express these details in communication (see discussion in Hauser, Chomsky and Fitch, 2002).

Evidence from fossils

Despite the issues raised by the lack of correlation between communicative ability and brain size, many have studied the range in skull size and looked at other features that could indicate language capabilities in primates and fossil hominids. Skulls assigned to *Australopithecines* have a volume of around 650cc, *Homo habilis* a volume of around 800cc, *Homo erectus*, 900-1000cc compared with humans who have a range of 700-2,200cc and a mean of 1,360cc. To name a few examples of variation in skull size between humans of normal intelligence, Jonathan Swift measured at 2,000cc, Anatole France at 1,000cc and an Australian Aborigine woman at 830cc.

The recent fossil finds of Flores man *Homo Floresiensis* at about 1 metre tall and with a brain capacity of around 400cm³ has extended this debate further. Tools and evidence of fire at the site suggest a 'human-like brain' (Brown *et al*, 2004) with behaviour suggesting communication, for example, hunting stegodons, fire and crossing the straits. It must be remembered that a nanocephalic dwarf with a brain volume of 300-400cc, less than that of a typical chimpanzee, can learn language, although ability is restricted by IQ (Pilbeam, 1979). Structure, not volume is important. Some have argued that the prolongation of childhood in humans compared with other primates has allowed for the greater volume and complexity to develop, but this begs the question of how the differences in structures and the

complexity underlying the linguistic ability of humans can emerge. To use an analogy, more time for an examination paper will not give us greater marks if we do not have the knowledge in the first place.

Language activity of the brain involves a large scale neuro-cognitive network including Broca's and Wernicke's areas (Aboitiz and García 1997). Some have examined the interior of the skull case to look for the indentations caused by the development of the lobes of Broca's area. Now primates also have this area of this frontal lobe present, but it is associated with other activities, so the mere existence of these areas of the brain cannot be used to argue for the presence of language (Galaburda and Pandya, 1982 and Deacon, 1989). Another key fact is that the vocal calls of primates are controlled not by cortical areas of the brain such as Broca's, but separate organs, the brainstem and limbic systems, areas that in humans are largely responsible for our emotional responses. As Pinker writes, "genuine language is seated in the cerebral cortex" (Pinker, 1997).

During the years when man's ancestor was commonly thought to be Neanderthal man, there was considerable interest in reconstructions of the head and neck, especially the placement of the hyoid bone and the position of the basicranium, because these were thought to show the position of the larynx or voice box. One influential reconstruction of Neanderthal man had placed the larynx in a high position without enough space at the back of the mouth to form the range of vowel sounds used by man (Lieberman and Crelin (1971). However, neither would swallowing be possible in this case. In later reconstructions which allowed for swallowing, there was enough space for a full range of speech sounds and now it is generally accepted that Neanderthal man was fully human in his language capacity (Falk, 1975; LeMay, 1975) although with some anatomical differences. (see Lubenow, 1992 for a detailed discussion)

Archaeological evidence provides no direct clues about language beyond 5-6,000 years as this is when the earliest examples of written language can be found. However, as far back as archaeological remains are found, there is evidence of cultural development and art in both the near East and the Oriental world. Tool construction indicates planning and foresight which has led to many evolutionists suggesting that language and tools developed at the same time. Similarly for co-operative living, there must have been language. For evolutionist it is a 'chicken and egg' situation. Without language, the structure of society is not possible and for language to be needed there must be a community of humans.

Summary

Language is important from a Biblical perspective as part of our humanity because we made in the image of God: God who communicates within the Godhead and with the human race. A survey of the natural communication skills of various animals shows a range of abilities, some substantial and essential for co-operative living within their groupings. Similarly training can enhance these skills in certain animals to a considerable extent, for example in pigeons, dolphins and chimps. However, there is a qualitative difference between this and the language abilities of humans that can generate an endless variety of meanings and nuances to convey both things in the here-and-now and also discuss absent and abstract topics. To quote Chomsky (in Horgan 1990) commenting on the experiments with primates. "saying apes can acquire language because they can learn some simple signs ... is like saying that humans can fly because they can jump." ■

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■ John Ray's Design Arguments



Sheena Tyler

Arguments for creation from design in the natural world are a positive and powerful approach to the issue of evolution. Many people quote Paley and his discussion of the design of a watch. Opponents too, make reference to his writings, for example, Dawkins' book "The Blind Watchmaker". However, many do not realise that the antecedent of Paley's Natural Theology is Ray's "Wisdom of God" (Ray, 1691), a masterpiece, surpassing Paley in prose and argument. Moreover, Paley plagiarised the "Wisdom of God" extensively, with almost its whole contents found rewritten and recognisable in Paley's pages (see Tyler, 2004).

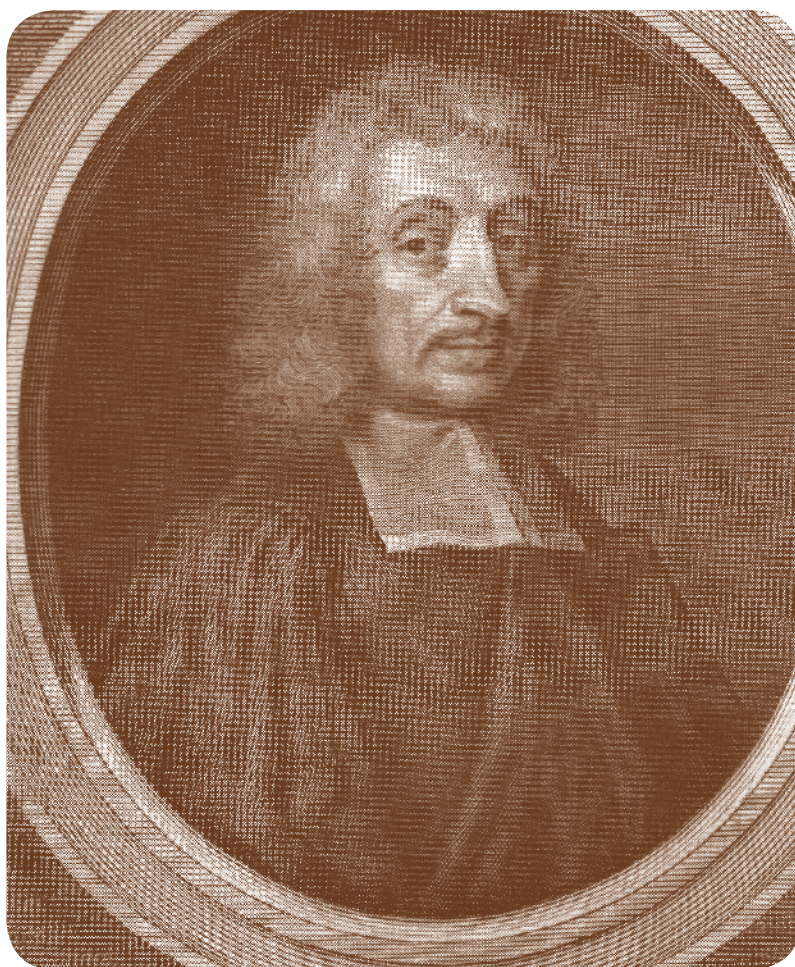


Fig.1 John Ray.

Ray kept atheism at bay in his generation. Pagan atheistic views had become fashionable during the Renaissance Period just before Ray's time. Ray attacked these head on, tracing them back to the ancient Greek, Epicurus. Today's a resurgent Epicurian philosophy underpins abortion, euthanasia, and the like. Ray shows us a way to turn back today's tide of atheism and its bitter fruits.

The arguments that Ray makes in the "Wisdom of God" (Ray, 1691) against unguided chance processes are in essence those of irreducible complexity and intelligent design concepts. It is useful to consider the main points of his arguments.

"There is no greater ... and more convincing argument of the Existence of a Deity, than the admirable Art and Wisdom that discovers itself in the Make and Constitution, the Order and Disposition, the Ends and Uses of all the Parts and Members of this stately Fabrick of Heaven and Earth: For if in the Works of Art,

as for Example, a curious Edifice or Machine ... infer the Being and Operation of some intelligent Architect or Engineer, why shall not also the [infinitely more grand and magnificent] Works of Nature infer the Existence of an Omnipotent and All-Wise Creator? (Ray, 1691, p. 30)"

Ray argues above for the existence of an omnipotent Creator. In his book, he then goes on to show how atheists have set up hypotheses to evade the force of these arguments. He focuses particularly on Epicurus and Lucretius. It is astute of Ray to do so. A recent analysis concludes that the underlying cause of moral decline in Western culture, with its materialistic atheistic associations indeed all started with the Greek philosopher Epicurus (Wiker, 2002).

Epicurus elevated the seeking of pleasure to a high status and he believed that the study of nature was one way that such pleasure could be attained. However, he claimed that this was only possible in a state of mind called 'freedom from disturbance' and he attributed such disturbances to "the anxieties and dread of religion". He suggests that the study of nature, rather than being a quest for truth, should be therapeutic in the search for pleasure and that it would be, once the disturbing notions of divine influence were eliminated. So, for example, to believe that death is the end would remove fear of punishment in the afterlife. Acceptance of such a view would establish a state of tranquillity in the adherent. His argument was based on proposing that nature and the universe are eternal. If so, there is no need for a higher, eternal being to create it. His universe was composed of fundamental, unchangeable and eternal atoms (Greek: not able to be cut), which were simple, differing only in size and weight. In his view, then complexity in the universe is merely "apparent". "The simple, wonderless atoms of Epicurus numbed our awe of nature – and what we do not hold in awe does not disturb us" (Wiker, 2002).

In the first century B.C. the great poet-philosopher, Lucretius, was even more influential than Epicurus in transmitting these ideas into modernity. In his writings, we find the evolutionary arguments of natural selection in fledgling form, particularly in his poem, *De Rerum Natura* (Wiker, 2002). Part of his rationale is yet again the appeal to the disteleology argument! Thus he claimed in *De Rerum Natura*:

That in no wise the nature of all things
For us was fashioned by a power divine –
So great the faults it stands encumbered with.
... desert fens, and wastes of sea
Well-nigh two-thirds intolerable heat
And a perpetual fall of frost doth rob
From mortal kind. And what is left to till,

Even that the force of Nature would o'errun
 With brambles, did not human force oppose,
 Long wont for livelihood to groan and sweat
 ... and to cleave
 The soil in twain by pressing on the plough.

Either the sun with baneful heats
 Parches, or sudden rains or chilling rime
 Destroys, or flaws of winds with furious whirl
 Torment and twist. Beside these matters, why
 Doth Nature feed and foster on land and sea
 The dreadful breed of savage beasts, the foes
 Of the human clan? Why do the seasons bring
 Distempers with them? Wherefore stalks at large
 Death, so untimely?

(Lucretius, 50 BC).

This is extraordinary! We see here virtually a commentary of Genesis 3, the cursed state. Yet Lucretius comes to the bizarre conclusion that these phenomena disprove the existence of God! During the Renaissance, with its brooding displeasure of Christianity and appeal to the paganism of the ancient classics, the poetic brilliance of Lucretius came to be revered (Wiker, 2002).

Into this arena came Ray! It is to his credit that the focus of his arguments in the earlier parts of the "Wisdom of God" is directed against Epicurus and Lucretius. Ray addresses the "folly of these ungrounded ideas, with the confutation advanced by Cicero":

A chance "Concourse of Atoms could never compose so well-ordered and beautiful structure as the world is; if the works of Nature are better, more exact and perfect than the Works of Art, and Art effects nothing without Reason, neither can the Works of Nature be thought to be effected without Reason. A Wonder then ... that there should be any Man found so stupid and forsaken of Reason, as to persuade himself; that this most beautiful and adorned World was or could be produc'd by the fortuitous concourse of Atoms ... He may as well admit, that if there were made innumerable Figures [of the alphabet] shaken and mix'd together, and thrown down from some high place to the Ground, that when they lighted upon the Earth that a Man might see and read in them Ennius's Annals; whereas it were a great Chance if he should find one Verse thereof among them all."

"... should anyone of us be cast upon a desolate island, ... should he find there but upon one single Sheet of paper, an epistle or oration written, full of profound sense, expressed in proper and significant Words, illustrated and adorned with elegant Phrase, were it beyond the possibility of the Wit of Man to persuade him that this was done by the temerarious Dashes of an unguided Pen, or by the rude scattering of Ink upon the Paper, or by the lucky Projection of so many Letters at all Adventures, but he would be convinc'd by the evidence of the Thing at first Sight, that there had been not only



Fig.2 Ducklings. © Chantal Saville www.iStock.com

Ray comments: "Web-footed nestlings instinctively take to the water (even if raised by a hen), nor do land fowl ever venture to swim there."



Fig.3 Butterfly. © Parameshwaran CR www.iStock.com

Ray comments: "Insects instinctively lay their eggs on the exact plants to which the hatchlings will be suited for their specific food source."



Fig.4 Newborn baby. © Sheena Tyler

Ray considers the muscles of ventilation at birth: "Why could they not have rested as well as they did in the womb?!"

some Man, but some scholar there" (Ray, 1691, pp36-37).

The thread of the argument for intelligent design given above is woven through the numerous examples of nature that he goes on to describe. He reasons:

"the various strange instincts of Animals... necessarily demonstrate... that they are directed to Ends unknown to them, by a wise Superintendant (Ray, 1691, p.125).

He comments, for example, on nesting behaviour:

"as we see Ducklings, tho' hatch'd and led by a Hen, if she brings them to the Brink of a River or Pond of Water, they presently leave her, and in they go, tho' they never saw any such Thing before ... So that we see every Part in Animals is fitted to its Use, and the knowledge of this Use put into them; For neither do any Sort of web-footed Fowls live constantly upon the Land, or fear to enter the Water, nor any Land-Fowl so much as attempt to swim there" (Ray, 1691, p.127).

A yet further example of his thought concerns instinct in insects:

"Insects which do not themselves feed their Young nor treasure up Provision in Store for their Sustenance, lay their Eggs in such Places as are most convenient for their Exclusion, and where when hatch'd, their proper food is ready for them ... should they affix them to the Leaves of a Plant improper for their Food, such Caterpillars must needs be lost, they chusing rather to die than to taste of such Plants [for some caterpillars] hath a nice and delicate Palate, some of them feeding only upon one particular Species of Plant ... utterly refusing [others] of a contrary" (Ray, 1691, p.123).

Another yet further example of his thought concerns reproductive physiology:

"And here methinks appears a Necessity of bringing in the Agency of some Super-intendent intelligent Being ... For what else should put the Diaphragm, and all the Muscles Serving to Respiration, in Motion all of a sudden so soon as ever the Foetus is brought forth?"

He asks, almost comically:

"Why could they not have rested as well as they did in the Womb? What aileth them that they must needs bestir themselves to get in Air to maintain the Creature's Life? Why could they not patiently suffer it to die?" (Ray, 1691, p.77)

Ray refused to speculate on the nature of guiding phenomena, only referring to "God using for these effects ... some Plasticke Nature" which he links to God's Providential power, that moves and direct the laws of nature (Ray, 1691, p.54). Neither was it a "God of the gaps" reasoning for a deity, i.e. merely invoking God because there is a gap in the causal explanation.

Pearcey & Thaxton (1994) reason that natural theology [a form of apologetics inspired by the way in which the living world strongly suggests God's handiwork] such as Ray's did not argue from ignorance of natural causes. Rather it reasoned from an expanding knowledge of the complexity exhibited by living things – and from their similarity to [intelligently designed] human artefacts. Indeed as our understanding increases of the intricacies of this physiological process within the whole remarkable unfolding story of reproduction, such as the above example of the triggering of air ventilation at birth, its precision and perfection are, so to speak, breathtaking.

Conclusions

In Ray's view of nature, intelligent design is embedded in the natural world. This is not because there are gaps in causal explanation, but because the structures and processes we see are only comprehensible if we invoke an intelligent designer (David Tyler, personal communication). Where would Ray have placed himself in the spectrum of ideas today? He would have aligned himself with the Biblical Creation community rather than with evolutionary naturalism: he was resolutely opposed to unguided, unsupervised chance processes as being the key to origins. Such crucial arguments are excised from the Ray championed by theistic evolutionists. Their Design cannot be

discerned scientifically, and their science is divorced from faith by complementarity. This portrayal of Ray is an impoverished one. Rather, Ray is a naturalist who champions the wisdom of God apparent in His Creation.

Ray also goes further than the Intelligent Design Movement, because he would want to affirm the identity of the Creator and relate his work to Biblical Revelation, – a missing note in contemporary biology. However, Ray had a missing note too – disteleology and apparently malevolent design. Our argument needs to explain the good, the bad and the ugly design if it is to have a sharp cutting edge. "There cannot be a God, because He wouldn't have designed it this way" is a theological statement, but not a Biblical one. God did not design nature badly in the first place. The bad entered the story in Genesis 3. It is not that the design of the created order is bad, rather that the atheist's theology is ramshackle.

In attacking the resurgent Epicurianism, Ray kept atheism at bay in his generation. From Paley onwards, the battle began to be lost. Soon we had Darwin, and then Haeckel, who took Epicurianism to much greater heights, and whose ideas were pervasive amongst not only Hitler but the wider Nazi leadership and society, culminating in the holocaust. Today these ideas underpin abortion, euthanasia, population control and therapeutic reproductive technologies ... the silent holocausts of our time. Perhaps we have no idea how much God will use us too, like Ray, if we will only speak out.

Ray was right to highlight the exquisite, which cannot be rejected on the grounds of disteleology. Today, the evidence is even more compelling. There are instances of nano-engineering in the biological world that immeasurably surpass anything that human engineers could ever achieve (Dembski, 2002). Such evidences of design are real and pervasive. Ray's many probing questions remain just as valid and incisive today in the arguments against the sufficiency of nature herself to generate complex novelty. ■

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■ BCS Geology Group
Workshop, September 2005



David Tyler

In September 2005, BCS members with an interest in geology met for their annual workshop, this year in Oxfordshire. The first day was spent in seminars and discussion, with the theme of understanding Jurassic rocks. The following day involved excursions to examine local Jurassic rocks, including those found in Ardley Quarry, north of Oxford. This report is concerned with that quarry visit.

The rock being extracted is the White Limestone, one of the units within the Great Oolite Group of the Middle Jurassic. Above and below this formation are other limestones, all with marine fossils. The quarry is largely worked out and is now being used as a land-fill site. Within the White Limestone is a particularly hard horizon, which was at the right depth to be used as a floor for the quarry, giving good support to heavy machines. It was in this floor that well-preserved dinosaur trackways were first found in 1997.

We were able to identify numerous trackways, most of which were partially concealed under the mud drape which covers the quarry floor. One of them could be traced for over 100 metres.

Published research on these trackways has given new insights into dinosaur behaviour. This is from Day *et al.* (2002):

"Forty more or less continuous sauropod trackways were mapped, some in excess of 180m in length. [...] Virtually all of the trackways trend in a northeasterly direction and are subparallel to each other to within a few degrees. This signal strongly suggests that the sauropods formed a single herd. The footprints are consistently well preserved and do not show overprinting or erosion. They are preserved on a single bedding plane that was probably only exposed for a few hours between two high tides. The Ardley trackways indicate that sauropod herds may have contained more than one species."

Some theropod dinosaur tracks are also found. These are tentatively assigned to *Megalosaurus*, which was first described in 1824 from bones found in nearby Stonesfield (which we visited later in the day). These tracks have received close examination from Mossman *et al.* (2003) who write:

"A 60 meter-long portion of one theropod trackway is systematically characterized in terms of pitch, yaw, and roll of successive footprints. Variations among these parameters correspond closely with acceleration/deceleration intervals in the trackway, impressed by the animal in wet calcareous mud within the tidewater zone of a mid-Jurassic coastal plain."

In more popular language, this theropod appears to have broken out into a run, lengthening its



This track was made by a sauropod dinosaur as it walked over the lime mud. The heavy animal squashed mud under its foot and squeezed up sediment around it. When the hind foot came down just behind the front foot, a second depression was superimposed on the first, giving this kidney shaped imprint. © David Tyler

stride, perhaps attaining a speed of 20 mph. Seeing this giant beast racing along must have been a terrifying sight, and why it did this can be left to the imagination!

Our group discussed the problems evident in the environmental interpretation (cited above) for the origin of these tracks. The surface is said to have been exposed "between two high tides", but there is no direct evidence for an intertidal setting. The White limestone is an extensive marine deposit, shallow but not intertidal. It is not a "coastal plain" environment. Sedimentary structures associated with inter-tidal deposits are absent. Only one horizon with tracks has been identified. Furthermore, tides advancing on a modern beach erase tracks very quickly. All the evidence we have suggests that something unusual is happening here.

During the previous day, the Group considered evidence for tectonic control of the British Jurassic over short timescales. This provided the context for reinterpreting the depositional environment of the White Limestone and the Ardley tracks. Tectonic activity led to the limestone sea shallowing sufficiently for the surface to harden and for numerous dinosaurs to attempt a crossing. They were not walking along a beach at low tide, but were traversing a featureless expansive sea floor that had become temporarily exposed. Some time afterwards (days or weeks), the sea returned and limestone deposition resumed. In Britain, tectonic activity is very prominent in the Middle Jurassic, and is particularly evident in the Yorkshire area because it was nearer the centre of volcanism. Sediments there show frequent switching between marine and non-marine sediments, with the latter bearing witness to extensive dinosaur activity ("dinoturbation"). In Oxfordshire, the influence of tectonics was less dramatic, but nevertheless the switching was sufficient to change

the water depth abruptly by many metres. We can infer from the north-easterly direction of the Ardley trackways that the dinosaurs were heading towards Yorkshire.

For further comments on British dinosaur trackways and their interpretation within a framework of biblical history, please see Tyler (2003). For a wider perspective on the lifestyle of dinosaurs, please see Garton (1998). ■

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This line of sauropod tracks stretches right across the quarry floor until it disappears under cover at the far end. The surface is draped with mud, but the depressions caused by the tracks take longer to dry out after rain. © David Tyler

■ Letters to Christianity in response to:



What you need to know about the evolution debate by Tony Watkins

Christianity, August 2005, 15-16.

<http://www.christianitymagazine.co.uk/engine.cfm?i=92&id=341&arch=f>

I was very disappointed by Tony Watkins' article about the creation/ evolution debate and am not looking forward to the second instalment. Listing the different approaches to the issue would only be of help if each was allowed to explain itself properly and if no bias was evident. A pro-evolution bias came through very clearly and the young-earth creationist position was seriously misrepresented. I have been a young-earth creationist for forty years and I hardly recognised your description of this position, given on page 15.

The article contains errors of fact. Two of the most blatant are on pages 15 and 16 where Biblical Creation Ministries is referred to as 'British Creation Ministries' and the Biblical Creation Society is called the 'British Creation Society'. More important is the wrong impression given under No. 2 that Christians have always held diverse views about the age of the Earth and the interpretation of Genesis 1. The Christian geologist and Bible scholar Dr. Davis Young himself believes in an old Earth and wishes to be able to interpret Genesis 1 that way. Nevertheless, in his book *Christianity and the Age of the Earth* he says. "... divergence of opinion on this question is recent, for until the end of the eighteenth century, Christians were virtually unanimous in the belief that the Earth was about six thousand years old according to the teaching of Scripture." and "It cannot be denied ... that the almost universal view of the Christian world until the eighteenth century was that the Earth was only a few thousand years old." (Both quotations from Chapter 1)

I went to Sussex University in the 1960s to study biology in the department of world-famous evolutionist Professor John Maynard Smith. When I arrived I was a theistic evolutionist. A committed Christian, I had been led to believe that there was over-whelming evidence for evolution and that I therefore had to re-interpret Genesis 1 so that it was compatible with this view. I left Sussex with a good degree but as a convinced creationist. When you got up close to it, the evidence just wasn't there. What *was* there was an atheistic framework within which the question of origins was being interpreted.

I hope you will give opportunity for a more informed discussion of these important issues. ■

Sylvia Baker

Sir,

Tony Watkins writes "by focusing on controversy, we are missing significant opportunities to communicate the good news of Jesus Christ in a world, which desperately needs to hear it."

In the article, Paul Garner, of Biblical Creation Ministries, was allowed a sound-bite to say that the motivation for creationists is the gospel! I was quoted as saying that Theistic Evolutionists lack clarity in their thinking about human death being the consequence of sin, and are fuzzy about the historicity of Adam and Eve.

Creationists are vocal because these issues strike at the heart of the Gospel. We consider that if we do not show ourselves faithful to the biblical teaching about the human condition, we cannot communicate the good news of Jesus Christ to our needy world.

This is not focusing on a controversy but bringing the light of God's truth to illuminate our lives. ■

David Tyler

Book reviews



■ **Comparative Biomechanics**

by Steven Vogel

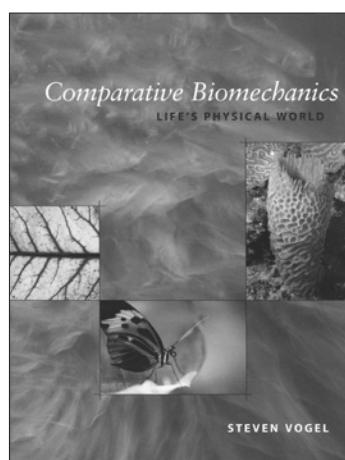
Published by PUP, 2003.

Pages 517pp **£41.95**

ISBN 0-691-11297-5



Review by Stuart Burgess, Professor of Design & Nature,
Department of Mechanical Engineering, Bristol University



The subject of Biomechanics is concerned with describing how living things function. The subject area deals with things in nature such as pumps, motors, wings, hinges and locomotion. The subject is quite accessible because it generally deals with macro-design of things that are commonly seen in nature.

In the case of animal locomotion, the book describes the biomechanics of several types of land locomotion including two legged movement, 4 legged movement and snake locomotion. The book gives pictorial

examples of trotting and galloping locomotion for the horse. The book also uses graphs and equations to show how each gait is more efficient at certain speeds and certain body sizes. There is a comprehensive section on flight which includes a description of flight in different creatures including mammals, birds and insects. The mechanics of flight are described with the aid of equations and graphs and these show how flight is a very sophisticated activity that needs highly optimised design. The book also includes examples of many sophisticated materials and structures in the natural world.

The subject of biomechanics is of interest to creationists because it seeks to explain "design" in nature. Anyone who wants to expound the "Design Argument" in depth should be a student of biomechanics. Most books on biomechanics are written for non-specialists because biomechanics is a multi-disciplinary subject including biology, physics and engineering.

This large book by Steven Vogel is likely to be a leading textbook in biomechanics in the next decade and will be read by many undergraduate engineers and biologists around the world. The book brings together the latest discoveries about the way things work in nature. Unfortunately, Steven Vogel is an ardent supporter of evolution and accepts the theory as a fact of science. This is sad because one of the first writers in the subject area, D'arcy Thompson, had serious doubts about whether evolution could properly explain Design in Nature.

Comparative Biomechanics describes a wide range of amazing designs in nature including complex mechanisms in fish mouths, insect flight

mechanisms, animal locomotion, numerous types of efficient materials and many different types of pumps. Vogel has identified no bad designs in nature. Yet Vogel himself admits that according to evolution, nature must contain imperfect designs (p 15). The book presents a serious problem for evolution because every single section describes supremely elegant and optimal design in nature.

It is amusing how the word 'design' causes embarrassment to Steven Vogel (p 14 and p 497). Vogel poses the question: "Why do organisms appear to be well designed if they are not designed at all?" (p 14). He explains that he cannot avoid using the word design. However, he urges the reader to read the word as a noun and not a verb. Despite the caveats that Vogel gives about design, the whole book gives the impression that nature does indeed have a designer!

Vogel also admits that evolution is a restricted process. He mentions the "enormously conservative and constrained character of natural design – compared to which human engineers are unfettered free spirits." (p 516). However, Vogel does not attempt to explain how the 'enormously restricted' process of evolution could have produced the immensely intricate designs of living organisms.

Vogel makes no attempt to explain how life evolved. This is difficult for Vogel to justify because if evolution had occurred, engineers would be eager to know how good designs evolve. There is no doubt that one reason why Vogel does not attempt to explain evolution is that it would be totally impossible for him to do this.

This is a comprehensive and informative book that describes many wonderful designs in nature. Sadly, it does not even acknowledge the Creator who made those wonderful designs. ■

■ **Without Excuse:**
A Vindication of the Argument from Design
 by David N. Samuel

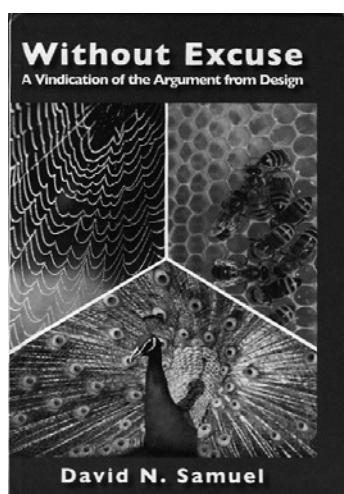
Published by The Harrison Trust, 2004.

Pages 301pp **£15.00**

ISBN 0-907-22327-3



Review by Colin Reeves



Without Excuse is a recent publication by The Harrison Trust of David Samuel's PhD thesis from 1983. The overriding purpose of the book is a laudable attempt to re-establish the legitimacy of the philosophical design argument, *i.e.* that the universe is both rationally ordered and intelligently designed. Samuel's primary method in doing this is to show that the design argument is not so much in conflict with science, but with scientism. It is this naturalistic, popular science-based worldview and metaphysic, rather than science itself, that is both parallel to and at odds with intelligent design.

Before giving an outline of the book and highlighting some of the stimulating material found within it, let me first make two less positive comments. First, the book, though indeed illuminating and thought-provoking, is not an easy read. As a published PhD thesis this is to be expected. However, for this reason alone, I would only recommend the book for those who have a specialised interest in the teleological argument. Second, some of the arguments of the book have been superseded by more recent discussions and publications. It would have been more useful to have had a major revision of the original thesis interacting with the modern design arguments of Dembski *et al.* I appreciate that other commitments on the author's time have probably precluded this possibility.

The structure of the book is straightforward and follows an historical timeline. Samuel begins by opening up William Paley's classical presentation of the design argument. Before beginning my review of this book by David Samuel, I had just finished reading Alister McGrath's recent book, *Dawkins' God*. In that book, McGrath is highly dismissive of Paley's teleological arguments. I was not convinced by McGrath at the time, and even less convinced after reading Samuel. Sadly, Paley does receive much negative comment today from many quarters and Samuel's reaffirmation of Paley's arguments is timely.

There are some misunderstandings of Paley. First, Paley did not believe that natural theology dispensed with the need for revelation. Paley would argue that natural theology does not stand alone, but is merely a stepping stone

to revelation, providing a partial, though limited confirmation of belief in a Creator. Paley would not see the design argument as likely to persuade someone, who does not already believe, of the existence of God. Second, in Paley's day it was generally understood that even varieties within species were immutable. In other words, every variation, *e.g.* horses, zebras, and donkeys, had been separately created by God in their precise form. Paley concurred with this mistaken view, but this understanding of Paley is not central to his arguments.

In the next chapter of his book, Samuel moves on to consider the philosophical criticisms of design. By presenting the arguments of Kant and Hume in particular, Samuel shows how they endeavoured to establish that the existence of God was not empirically verifiable. Many today believe that Hume and Kant destroyed the validity of any design argument. As R. H. Hurlbutt has written: "Design had been moribund before the *Origin* was even written. If Darwin slew Paley, surely it was a corpse rather than a living, breathing body of thought that was delivered up to destruction. ... [T]he fatal blow had been dealt ... by ... David Hume." But this is not true. Because the philosophical arguments against were inconclusive, the design argument still lived on.

Next, in chapters 3 and 4, Samuel gives to us a detailed description of the state of the design argument from Paley's day until the publication of *The Origin of the Species* by Charles Darwin in 1859. Though these two chapters formed, at least for me, the least helpful part of the book, it is interesting to note that, during this period, natural theology was not held to be a perfect system. Instead, it was considered as essentially "impressionistic", *i.e.* not a question of clear cut premises and conclusions. This becomes of particular relevance when the design argument is compared with Darwin's theory, as metaphysical worldviews, later on in the book.

In chapter 5, we move into the most interesting part of the book. Samuel gives an insightful study of why Darwin's theory was readily accepted by many at the time of its publication. Fundamentally, the theory of evolution has the same characteristics as the teleological argument, *viz.* an *a priori* concept (natural selection or design) followed by the accumulation of examples and illustrations. In essence, both evolution and design are metaphysical worldviews and the strength of

Darwin's argument is psychological rather than logical or rational. By the 1870s, much of Darwin's proposal concerning natural selection was discredited, whereas acceptance of his theory continued. Natural selection had been used by Darwin to stimulate the imagination of his readers in order for them to accept his theory of evolution. Once accepted, the tool was not so vital; a new worldview had been established.

To express this differently, the thinking behind Darwin's theory is an ideology: a way of making sense of reality. As Samuel explains, ideologies are not necessarily objective and they often have a lack of precision in the terms they use (*e.g.* natural selection). Ultimately, ideologies reinterpret the facts in order to fit the theory. Even more striking, there are no arguments that can disprove a firmly held ideological belief. An ideology is shockproof and that is because its usefulness is not in conformity or lack of conformity to fact, but in making reality understandable. That I found a most illuminating insight into the evolutionary mindset, even of today.

A second issue that Samuel brings out in this chapter is Darwin's personal dislike for design and miracles. Darwin was happy for an omniscient being to foresee, but not to ordain. Thus, for Darwin, an ordaining Creator meant that his theory of evolution was superfluous, not for any scientific reasons, but simply for metaphysical ones. The rejection of design was essential to Darwin for his theory to be meaningful. In practice, Darwin was muddled in his thinking. Darwin was a naturalist, but he also had an inner consciousness that God exists and so, throughout his life, Darwin knew an internal conflict between his naturalistic worldview and the notion of a Creator God.

In the following chapter, Samuel looks at the various attempts, in the years following the publication of *The Origin of the Species*, to reconcile Darwin's theory with the classical argument for design. Generally speaking, the design argument was reduced in prominence. No longer a weapon in Christian apologetics, it was now something to be defended. Attempts to reconcile the two worldviews were primarily twofold: first, to state that naturalistic evolution only answers the "how" and not the "why"; and second, to point out that Darwin's theory does not explain the design of the original organic form. Both these attempts are much weaker versions of the classical teleological argument.

In the years following 1859 and the publication of *The Origin of the Species* many wanted a design element included within Darwin's theory (*i.e.* a theistic evolutionary view), but where the import of Darwin's ideas was properly understood and accepted, it was recognised that naturalistic evolution was irreconcilable with any form of design. A full acceptance of Darwin's natural selection by small, random variations is necessarily naturalistic.

In the final two chapters of the book, Samuel directly compares the two arguments or worldviews, *viz.* design and descent by natural selection. Unlike the teleological argument, the theory of evolution is incapable of explaining many aspects of the natural world in which we live. Samuel shows how such things as beauty, our moral character and religious consciousness, and the rationality of our minds cannot be reduced to naturalistic causes. Beauty, for example, is pervasive within nature and, yet, the natural world, except for man, does not appreciate it. Even man's own awareness of beauty is not attributable

to utilitarian causes. Thus, beauty within nature cannot be merely accidental.

Also within this concluding section of the book, Samuel shows how the logical result of Darwin's theory is that all theories and ideas (including Darwin's own) are meaningless. A naturalistic theory cannot surmount its inherent limitations: an unthinking process cannot produce thinkers, the non-rational cannot produce the rational mind of man. In other words, if naturalistic evolution is true, the mind simply cannot be trusted to arrive at truth regarding the world and man. Samuel gives two interesting quotes in support. C. S. Lewis: "Every theory of the universe which makes the human mind a result of irrational causes is inadmissible, for it would be a proof that there is no such thing as proofs, which is nonsense." J. B. S. Haldane: "If my mental processes are determined wholly by the motion of atoms in my brain, I have no reason to suppose that my beliefs are true ... and, hence, have no reason for supposing my brain to be composed of atoms."

In this book David Samuel sets out to show the continuing legitimacy of the design argument in today's post-Darwin world. In this aim the author succeeds and, with the two caveats mentioned above, the book is warmly commended. ■

■ The Design Revolution

by William Dembski

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Review by Colin Reeves



Intelligent design (ID) has become a significant challenge to Darwinian orthodoxy during the last decade. Initiated by Phillip Johnson (*Darwin on Trial, Reason in the Balance*), carried on by Michael Behe (*Darwin's Black Box*), it has received its most comprehensive statement by William Dembski. This is his fourth book, and in many ways his most accessible. The chapters are mostly short and pithy, many being instigated by questions and challenges from critics, while others can be seen as clarifications of issues raised by Dembski's arguments for specified complexity in his earlier books.

Dare I say it, but there is a sense in which the notion of specified complexity is still evolving! In chapter 10, to take one example, he introduces the idea of *specificational* complexity, which was not articulated so clearly in his earlier *No Free Lunch*. Technically, the idea is to link together the occurrence of high complexity in the Shannon sense, with low complexity in the sense of the Chaitin-Kolmogorov-Solomonoff algorithmic complexity measure. (For those who haven't a clue what this means, an informal statement is as follows: specified complexity is recognized by the occurrence of a pattern that is highly improbable and at the same time capable of being described fairly concisely.) True, the idea is present in his earlier work, but the terminology isn't. Another case of further progress in his thinking is the way he relates specified complexity to Fisher's hypothesis testing procedure (a procedure used by thousands of practitioners in the sciences every day). In my view, as a mathematician, this is a helpful advance in our understanding of what it means to test hypotheses. Again, this was inherent in *No Free Lunch*, but the case is made here with greater clarity.

There is a fair degree of repetition, and some strange inconsistencies, suggesting that many of the chapters were originally written independently and subsequently stitched together to make this book. For example, in two places the frequency of the letter e in the English language is 13% (pp. 155, 241), but on p.135 it's 12%. Again, the material on the Russian notion of "TRIZ" on p.312 is an almost verbatim copy of p.287, and his speculation about designs containing "operating manuals" on p.273 is repeated on p.316. So the editorial stitching could have been done better. (However, the repetition is no bad thing if this is the first time you have read Dembski, for it helps to drive home the

basic concepts associated with specified complexity.) Another minor editorial irritant is the lack of a subject index, so that finding the several places where a particular idea is discussed is harder than it should be; there is an index of authors, but this is less useful.

The chapters are arranged thematically in sections: the first section lays out basic principles; the second updates his earlier work on detecting design, and the third looks at several aspects of the crucial topic of information. The fourth and fifth parts deal with challenges arising from a naturalistic worldview, where Dembski's arguments demonstrate again and again the incoherence of the opposition to ID.

Much of the book is fairly technical, and it is a considerable help to have a background in mathematics and statistics, but Dembski uses a variety of illustrations and examples, so that even without such a background, it should be possible to grasp the basic ideas. The final section is in some respects the most important, as here Dembski considers the future of a science that takes ID seriously. For Christians who are scientists and who want to use ID positively as part of their scientific research, this part offers some interesting suggestions and speculations.

Dembski's aim in this book is clearly to define ID more sharply: what it is; what it isn't; how it relates to other notions. The discussion is wide-ranging, covering such topics as natural theology, the anthropic principle, multiverses, the objective/subjective and ontological/epistemological distinctions. The other focus is on answering critics, and whether it is the charge that ID is an argument from ignorance, is untestable or unreliable, or is religion in disguise, Dembski presents his case persuasively and clearly.

Non-scientific Christians will also find much of value here. It is not surprising that the book requires at least an acquaintance with science, as Dembski wishes to stress that ID is a scientific idea. Nevertheless it is an idea that has theological implications – just as Darwinism does – and Dembski devotes several chapters to these, mainly in the first part (chapters 1-7). His claims for ID are theologically modest, even minimalist: ID needs to be distinguished from the classical design arguments of natural theology, and there is no Thomist idea of theistic proofs whereby we ascend

from nature to God. Several later chapters also have some theological content; for example, in chapter 24 he argues that ID need not entail miracles (conceived of as supernatural acts). Indeed, ID does not attempt to identify the Designer, although in Dembski's own view, He is the God of the Bible.

It is important for Christians to try to understand the arguments of the ID movement. There is an influential Christian "scientific establishment" in the UK, who have long espoused the position of "complementarity": science tells us "how", the Bible tells us "why". While holding a position that acknowledges God as in some sense the Creator, they maintain that His activity is undetectable, in that "natural causes" (in particular, Darwin's theory of variation and natural selection) explain all the complexity that we observe in the world around us. Thus, when push comes to shove, the Christian faith becomes just an "upper-storey" belief. To Christians who hold these views, Dembski presents a very real challenge. On the contrary, he says, design is empirically detectable. The gaps that exist in our understanding of the "how" of science – and only in our understanding, according to the Darwinists – are real, and natural causes cannot plug them, no matter how many "just-so" stories we concoct. Only intelligence can do the job.

For those who are unpersuaded of the "truth" of Darwinism, but just keep their heads down, it is an encouragement to realise that God has provided clear evidence of his marvellous designs, right down to the molecular level – just where the Darwinist programme has seemed most powerful. The Christian's faith in an all-powerful Creator is rational and consistent with what we see in the world. Although ID is not theology, it provides powerful support for the orthodox Christian doctrine of creation, and William Dembski's latest book is a significant addition to the growing volume of literature on ID and its implications. ■

> *editorial continued*

their world, and they fight it tooth and nail. Thus, ID is described as anti-science, absurd, appalling, and there are many other unsavoury epithets.

Yet intelligent design is recognised to be part of science when humans are the agents. Stone artefacts can be examined from the perspective of being fashioned by chance (abrasion in a gravel bank) or law (fracturing along certain weak planes within the material) or intelligent agency (impacted by a skilled human to make a tool). Archaeologists are perfectly familiar with the methodology and work with it routinely. Similar comments can be made about the activities of forensic scientists. Secularists cannot deny the scientific route to making design inferences, but they resist implacably the thought that the natural world cannot be explained without an Intelligent Agent. Their opposition to ID has spiritual roots and has nothing to do with protecting science.

Christian reactions to ID are also mixed. Whereas some recognise that ID has injected a breath of fresh air into "design in nature" questions, others exhibit varying degrees of dismay. How is this to be explained? Many of the concerns relate to a fear of "God-of-the-gaps" thinking, which thrives on ignorance and says "God did it!" This is an understandable fear, because we can find examples of this in history. However, it is not an argument that is effective against ID advocates, who routinely point out that design inferences are based on knowledge, not on ignorance. All the central ID arguments (such as irreducible complexity and specified complexity) draw on what we do know as a result of years of painstaking, thorough research.

Ever since my own student days, in the 1960s, I have been exposed to Christian teachers who say that the Bible addresses *why* questions whereas science addresses *how* questions. The Bible and science are said to be complementary ways of approaching the same subject. Of course, there is some truth in this, but it is not true that the Bible never addresses *how* questions! Adam was made from the dust of the ground. Eve was made from a part of Adam's side. Death became the experience of humans because Adam sinned. The Bible brings us history, and biblical history addresses both *how* and *why* questions.

If the analysis presented above is correct, the real reason for sustained opposition to ID from Christians is secularisation. Each of us faces the danger of imbibing the spirit of our age and failing to be renewed in our minds. We need to think in a Christian way and to guard against the cultural atheism that is so pervasive in our society. Complementarity thinking brings with it the danger of failing to see the secularisation trend in science. This is a great weakness. Complementarity also makes it impossible to think clearly about the ID issue. This is because 'intelligent design' has to be an objective characteristic of an artefact (within the scope of science) and not a complementary characteristic perceived only by faith.

Clearly, this is not a difference of view among Christians that can be shelved. The stakes are high. It affects the way we perceive our national culture. Each of us needs to develop a Christian mind on these matters, so that we can bring God's Word meaningfully to those around us. The starting point is surely a prayerful searching of the Scriptures. Romans 1:18-21 and Psalm 19 are good places to begin. ■

David Tyler

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